REMARKS

This Amendment is in response to the Office Action of June 8, 2006, in which claims 1-18 and 21-36 were rejected and claims 19 and 20 were objected to. With this Amendment, claims 1, 9, 17, 20-27, and 36 are amended and claims 7, 8, 19, 28, and 35 are cancelled. Claims 1-6, 9-18, 20-27, 29-34, and 36 are now in the application and are presented for reconsideration and allowance.

In the Office Action, the drawings were objected to because two figures are labeled as "Fig. 11." A replacement sheet in which the lower figure on sheet 8 of 24 is labeled as "Figure 12" is submitted with this Amendment.

Claims 1, 9, and 24 were objected to because each included the phrase "For use with a source of electromagnetic energy." With this Amendment, claims 1, 9, and 24 have been amended to overcome the objection.

Claims 25 and 26 were objected to due to a lack of antecedent basis. Claims 25 and 26 have been amended to depend from claim 24, rather than claim 30. As a result, antecedent basis has been provided for claims 25 and 26.

Claims 1-2, 5-7, 9, 11-12, 15-18, 21-22, 24-25, 27-28, and 36 were rejected under 35 U.S.C. § 102(b) as being anticipated by Hix, Jr. (U.S. Pat. No. 4,758,087). Claims 7 and 28 have been cancelled, which renders the rejection moot with respect to those two claims.

Independent claim 1 has been amended to incorporate the subject matter of claim 8. Claim 1 requires an electromagnetic resonator having a dielectric body with a sensing surface and having a cavity forming a variable gap that varies in response to the sensing surface. In addition, the resonator is internal to the source of electromagnetic energy, forming a cavity of a mode locked source.

Hicks, Jr. does not show a sensor in which a resonator with a resonant frequency that varies as a function of a measurable parameter is internal to an electromagnetic energy source and forms a cavity of a mode locked source.

Claim 8 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hicks, Jr. in view of Paschotta et al (U.S. Pat. No. 6,834,064). Paschotta describes a mode locked laser system, but does not suggest a measurable parameter responsive resonator that is incorporated as part of a mode locked laser so that the output of the laser varies as a function of a measured parameter. Mode locked lasers have been known for many years, but no suggestion has been made of a combined laser and resonator/sensor as described in the present application and claimed in independent claim 1.

With the amendment to claim 1, the rejection of claims 1-2, 5, 6 as being anticipated by Hicks, Jr. has been overcome. Those claims are now in condition for allowance.

Independent claims 9, 21, 22, 24, 27, and 36 have each been amended to require that the dielectric body and the cavity are configured to resonate at suboptical frequencies as a function of the measurable parameter. In contrast, Hicks, Jr. describes a fiber optic transducer that operates at optical frequencies.

The disclosure by Hicks, Jr. of the transducer based upon an optical fiber resonant cavity does not teach or suggest a sensor operating at suboptical frequencies that includes a dielectric body with a cavity or gap that varies as a function of a measurable parameter. A device like Hicks, Jr., which uses optical frequencies, does not have to be concerned with leakage because the optical wavelengths are very short. A suboptical device like the present invention, on the other hand, operates with wavelengths that are longer. This affects the potential size of the device, and in particular the size of any shielding that must be used in conjunction with the sensor. As a result, a resonant sensor capable of operating at suboptical frequencies is an obvious extension or modification of Hicks, Jr. The present invention teaches that a suboptical sensor based upon a dielectric body with a very high dielectric constant can be small enough to be practical. With the amendments to independent claims 9, 21, 22, 24, 27, and 36, the rejection of those independent claims and dependent claims 11-12, 15-16, and 25 as being anticipated by Hicks, Jr. has been overcome.

Independent claim 17 has been amended to incorporate the subject matter of dependent claim 19. In the Office Action, claims 19 and 20 were indicated as being objected to, but containing allowable subject matter. With the amendment of claim 17 to incorporate the subject matter of claim 19, and with the amendment of claim 20 to depend from amended claim 17, independent claim 17 and dependent claims 18 and 20 are now in condition for allowance.

Claims 3 and 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hicks, Jr. in view of Pierce (U.S. Pat. No. 2,626,990). Pierce shows a "guided wave frequency range transducer" which uses metal wave guides. It does not teach the use of a sensor formed by a dielectric body with a variable cavity gap responsive to a measurable parameter to resonate at suboptical frequencies. Neither Hicks, Jr. nor Pierce, nor any combination of the two teaches or suggests the present invention, as defined in claims 3 and 13.

Claims 4, 14, 31, and 34 were rejected over Hicks, Jr. over Rinard (U.S. Pat. No. 6,046,586) and further in view of Matsui (U.S. Pat. No. 6,144,286). Hicks, Jr. does not teach a sensor with a resonator internal to a source to form a cavity of a mode locked source, where the resonator comprises a dielectric body with a cavity forming a variable gap that varies in response to a measurable parameter as required by claim 4. There is no suggestion in Hicks, Jr. of a device in which the resonator is a resonant transmission line as required by claims 4, 14 and 31, or a port antenna as required by claim 34. Neither Rinard nor Matsui provides the teaching which is missing from Hicks, Jr. Claims 4, 14, 31 and 34 are patentable over Hicks, Jr., Rinard, and Matsui.

Claims 8 and 10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hicks, Jr. in view of Paschotta et al. This rejection, as applied to claim 8 was discussed previously. Amended claim 1 now incorporates the subject matter of claim 8. Neither Hicks, Jr. nor Paschotta et al suggests a sensor in the form of a resonator internal to an electromagnetic energy source to form a cavity or mode locked source, so that the output of the mode locked source is a function of changes in the measurable parameter sensed by the resonator.

Claim 10 depends from independent claim 9, which has been amended to specify that the dielectric body and variable cavity gap are configured to resonate at suboptical frequencies as a

function of the measurable parameter. As amended, independent claim 9 and dependent claim 10 are neither taught nor suggested by Hicks, Jr. and Paschotta et al. The rejection of claim 10 under 35 U.S.C. § 103(a) should be withdrawn.

Claims 23, 26, 29-30 and 35 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hicks, Jr. in view of Rinard. Hicks, Jr. does not teach a device capable of resonating at suboptical frequencies as a function of a measurable parameter. While Rinard discloses resonating at suboptical frequencies (for example microwaves), Rinard does not teach or suggest a resonator in a dielectric body with a variable cavity gap capable of resonating at suboptical frequencies. Nor does Rinard disclose a device where a variable cavity gap is responsive to a measurable parameter to cause resonance at a suboptical frequency. The combination of Hicks, Jr. and Rinard does not teach or suggest the subject matter of claims 23, 26, 29-30 and 35. Those claims are now in condition for allowance.

Claim 32 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Hicks, Jr., over Rinard, and further in view of Neff (U.S. Pat. No. 5, 873,840). Although Neff describes a microwave resonator in the form of a slot antenna for sensing cranial pressure. The Ness resonator 22 is an enclosure having electrically conductive walls surrounding a dielectric medium. The Neff resonator changes frequency based upon deflection of one of the metal walls. In other words, Neff shows a low Q device – a metal resonator.

In contrast, the present invention requires a resonator formed by a dielectric body with a variable gap cavity within the dielectric body. The dielectric body is the deflecting element, not a metal wall as in Neff. The dielectric body confines energy locally, has a high dielectric constant, and has superior elastic properties to metals to act as a deflector that responds to a measurable parameter. Neff's low Q metal resonator does not teach or suggest the electromagnetic resonate sensor as defined in dependent claim 32. The rejection under 35 U.S.C. § 103(a) based upon Hicks, Jr., Rinard, and Neff should be withdrawn.

Claim 33 was rejected under 35 U.S.C. § 103 as being unpatentable over Hicks, Jr., over Rinard, and further in view of Edson (U.S. Pat. No. 2,698,923). While Edson discloses a resonant cavity used as a dipole antenna, it does not disclose a sensor having the configuration defined in independent claim 27, dependent claim 29, or dependent claim 33 which depends from claims 27 and 29. The mere fact that dipole antenna resonators have existed does not teach the sensor defined in claim 33. The rejection under 35 U.S.C. § 103 of claim 33 should be withdrawn.

Accompanying this Amendment is a Supplemental Information Disclosure Statement citing PCT Application WO02/44672, which was published June 6, 2002. This PCT application is a counterpart of Application No. 09/996,143 (now U.S. Pat. No. 6,901,101) of which the present application is a continuation-in-part. The PCT application was published more than one year prior to the April 12, 2004, filing date of the present application. For that reason, it is requested that PCT Application WO02/44672 be made of record in this application.

In conclusion, this Amendment has placed this application in condition for allowance. Notice to that effect is requested.

Respectfully submitted,

KINNEY & LANGE, P.A.

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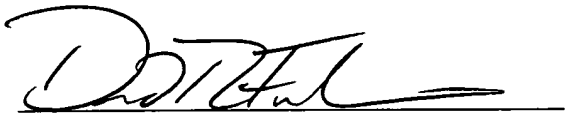
By: 

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